

REMARKS

The Applicants submit the current amendment in conjunction with a Request for Continued Examination of the present application filed concurrently with this Amendment. In this Amendment independent claims 1, 9 and 13 have been amended to overcome the Examiner's rejections stated in the final Office Action. Claims 1-21 remain in the application for reconsideration by the Examiner. The Examiner's allowance of all pending claims is earnestly solicited.

Within the first claim set, claims 1-3 and 5 have been rejected under Section 102(b) as anticipated by Iyer (6,433,404), claims 6 and 7 have been rejected under Section 103(a) as unpatentable over Iyer and claims 4 and 8 have been rejected under Section 103(a) over Iyer further in view of Wang (6,703,263).

To further distinguish the invention over the cited prior art, the Applicant has amended claim 1 as set forth above in the marked-up version of the claim. In particular, the Applicant has amended the claim to include, "a first substantially linear material layer having a first sheet resistance and defining first and second terminals at opposing ends thereof, the terminals having a substantially similar triangular shape and size" and "a second material layer coextensive with and overlying the first material layer throughout a length bounded by the first and the second terminals, the second material layer having a second sheet resistance less than the first sheet resistance." Support for these amendments can be found in paragraph [0033] of the specification and Figure 2 and the accompanying text at paragraph [0030]. The triangular shape tends to increase the current density in the linear material layer.

Iyer discloses a fuse in which "the cathode 104 [is] formed from a single material . . . and fuse link 106 [is] formed from a layer of polysilicon material 112 . . . having a silicided layer 114 formed thereon." See column 4 beginning at line 14. The rejection of claim 1 over Iyer is overcome as he discloses a "well-defined delineation of materials" at an intersection between the cathode 104 and fuse link 106 and therefore cannot disclose "a second material layer coextensive with and overlying the first material layer throughout a length defined by the first and the second terminals."

Further, from Iyer's Figures 1 (prior art) and 3 it can be seen that the terminals 102 and 104 are not substantially similar in size, as the Applicant claims in amended claim 1. Iyer also fails to disclose the terminals having a triangular shape as set forth in amended claim 1.

Finally, Iyer discloses that only the silicide layer is opened to blow the fuse. See the paragraph beginning at line 33 of column 4. The Applicant claims in the third paragraph of claim 1 that both the first and the second fuse layers are opened when the fuse is in the opened state. The language referred to by the Examiner at column 3, lines 53-64 does not specifically disclose that both the first and the second fuse layers are opened, only that there is an open or a material segregation, which increases the resistance, in the fuse circuit.

The Applicant therefore suggests that amended claim 1 is patentably distinct from Iyer.

As to rejected dependent claims 2 - 8 the Applicant contends that each of these claims, depending from amended claim 1, includes one or more elements that further distinguish the invention over the art of record. These claims should therefore be in condition for allowance.

The second set of claims, i.e., claims 9-12, have been rejected under Section 102(e) as anticipated by Wang (6,703,263).

To further distinguish the invention over the cited prior art, the Applicant has amended independent claim 9 as set forth above in the marked-up version of the claim. In particular, the Applicant has amended the claim to include, "a fuse structure comprising: a first substantially linear material layer having a first sheet resistance having first and second terminals at opposing ends thereof, the terminals having a substantially similar triangular shape and size." Support for this amendment can be found in paragraph [0030] and Figure 2.

Wang discloses at column 7 lines 10 and 11, "[t]erminal regions 28 are patterned to accommodate metal contacts that will later be formed thereon," and discloses rectangular terminal regions 28 in Figure 6. Also, Wang discloses at column 3, lines 1 and 2, "blow the fuse by causing the neck portion of the tungsten silicide layer to melt." By contrast, in amended claim 9 the Applicant claims, "wherein the fuse structure is programmable to an opened state in which an opening is formed in the first and the second material layers."

As to rejected dependent claims 10-12, the Applicant contends that each of these claims, depending from amended claim 1, includes one or more elements that further distinguish the invention over the art of record. These claims should therefore be in condition for allowance.

Within the third claim set, claims 13-15 and 17 have been rejected under Section 102(b) as anticipated by Iyer, claim 18 has been rejected under Section 103(a) as unpatentable over Iyer and claims 16 and 19-21 have been rejected under Section 103(a) over Iyer further in view of Wang.

To further distinguish the invention over the cited prior art, the Applicant has amended independent claim 13 as set forth above in the marked-up version of the claim. In particular, the Applicant has amended the claim to include, “forming, from the first material layer, a fusible link region and triangularly shaped and similarly sized terminal regions at spaced apart ends of the fusible link region;” and “forming a second material layer overlying the first material layer of the fusible link region, wherein the second material layer is disposed over the first material layer along a length of the fusible link region and the first and the second terminal regions, and wherein the second material layer has a second sheet resistance, and wherein the second sheet resistance is less than the first sheet resistance.” Support for this change can be found in specification paragraph [0030].

As described above, Iyer does not disclose or fairly suggest the elements of amended claim 13, including the triangularly shaped and similarly sized terminal regions and the second material layer disposed over the first material layer along a length of the fusible link region and the first and the second terminal regions.

Instead, Iyer discloses, “When this structure is biased with the negative voltage applied to cathode 104 and positive voltage to anode 102, the Aelectron wind@ [sic] (as indicated by arrows) will push the silicide molecules, especially in fuse link 106 where the current density is higher. Since cathode 104 is not silicided and includes polysilicon, the silicide in fuse link 106 that is moved towards the anode by the electron wind is not replaced at fuse link-cathode junction and a void is created. In this case, polysilicon is less affected than silicide by electron migration.” . . . “Since the silicide has much lower resistivity than the polysilicon, most of the electrons that carry the current will be crowded in the silicide in fuse-link 106 at the junction of the silicide and the un-silicided junction. Advantageously, this current crowding in the vertical direction at a substantially perpendicular interface 107 adds to the crowding due the shape of the large cathode connected to the thin fuse-link, and further amplifies the material migration effect at this junction.” As Iyer explains at column 4 beginning at line 37, only the silicide opens or agglomerates.

Further, from Iyer's Figures 1 (prior art) and 3 it can be seen that the terminals 102 and 104 are not substantially similar in size and triangular in shape as the Applicant claims in amended claim 1.

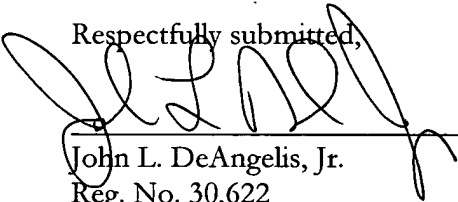
As to rejected claims 14-21, the Applicant contends that each of these claims, depending directly or indirectly from amended claim 13, includes one or more elements that further distinguish the invention over the art of record. These claims should therefore be in condition for allowance.

It is believed that the claims presented herein in conjunction with the Request for Continued Examination distinguish the invention from the art of record. It is therefore respectfully requested that Examiner Loke reconsider his rejections and issue a Notice of Allowance for all pending claims.

The Applicants hereby petition, under 37 C.F.R. 1.136, for an extension of time of two months from the mailing date of the final Office Action. A check in the amount of \$450.00 is enclosed in payment of the extension fee.

If a telephone conference will assist in clarifying or expediting this Amendment or the claim changes made herein, the Examiner is invited to contact the undersigned at the telephone number below.

Respectfully submitted,



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CERTIFICATE OF MAILING

I HEREBY CERTIFY that the foregoing Amendment is being deposited with the U.S. Postal Service as first class mail in an envelope addressed to: Mail Stop RCE, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on this 30th day of January 2006.



John L. DeAngelis